203. Proposed by S. A. COREY, Hiteman, Iowa.

$$\int_0^{\pi} \frac{\sin mx}{x} dx, \; m = \text{integer}.$$

204. Proposed by M. E. GRABER, A. M., Heidelberg University, Tiffin, Ohio.

Required the variation of $\int V dx$ where V is a function of x, y, $\frac{dy}{dx}$, $\frac{d^2y}{dx^2}$ ..... and v where $v = \int V' dx$ and V' is also a function of x, y, $\frac{dy}{dx}$, $\frac{d^2y}{dx^2}$ .....

205. Proposed by Z. T. JACKSON, St. Louis, Mo.

Evaluate $\int_0^{\frac{1}{2}\pi} \log \sin x \, dx$.

206. Proposed by DR. O. E. GLENN, Drury College.

Evaluate $\int_0^1 (1-z^n)^m \frac{\partial}{\partial z} \log(1-z^n x^n) dz$, assuming $-1 < x^n < +1$.

DIOPHANTINE ANALYSIS.

128. Prpposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

Required the highest powers of 2, 3, 5, 7, contained in (1000)!

129. Proposed by SYLVESTER ROBINS.

How many perfect squares containing 2^n figures each can be found, the parts of which standing on the right hand side thereof, represented by 1, 2, 4, 8, 16, 32, etc., digits, are also perfect squares. 24591681 is one such number. [From *The Mathematical Visitor*].

GEOMETRY.

263. Proposed by FREDERICK R. HONEY, Trinity College, Hartford, Conn.

Construct a sphere whose surface shall intersect the surface of any four given spheres in great circles.

264. Proposed by B. F. FINKEL, A. M., Drury College, Springfield, Mo.

Let l and m be two straight lines intersecting in A. With A as center and any radius r describe a circle intersecting l and m in E, M and G, Q, respectively, and the bisector of the opposite angles formed by l and m in F and K. With I, the middle point of EA, as center, and radius, r, describe an arc intersecting the bisector of the opposite angles formed by l and m in O. With O as center, and radius $OA+r$ describe circle $FHCDBJF$, F and D the points of intersection of this circle with the bisector of opposite angle; H, B the intersections on l, and J, C on m. What is the ratio of arc HFJ to arc BD?